

WE CLAIM:

5           1. A method of treating tissues within a patient's body with electrical energy, the method comprising the steps of:

10           providing an energy treatment device having an electrode and a distal tip, the electrode being located within the patient's body;

15           placing the distal tip within the patient's body adjacent the tissues to be treated with electrical energy;

20           energizing the electrode with electrical energy; and

25           electrically connecting the electrode to the tissues to be treated with an electrolyte fluid flowing from the electrode to the tissues for treating the tissues with electrical energy.

30           2. A method according to claim 1 wherein the energizing step comprises energizing the electrode with radio frequency energy.

35           25. A method according to claim 2 wherein the energizing step comprises energizing the electrode with electrical energy of approximately 50 Watts at about 500,000 Hertz..

30           30. A method according to claim 1 wherein the placing step includes offsetting the distal tip from the tissues to be treated by a distance less than twelve inches.

35           35. A method according to claim 1 wherein the energy treatment device comprises a catheter tube insertable into the patient's body, wherein a fluid lumen is disposed within the catheter tube, wherein the

electrode is within the catheter tube, and further comprising the step of:

5 passing electrolyte fluid through the fluid lumen such that the electrolyte fluid makes electrical contact with the electrode;

10 transferring electrical energy from the electrode to the electrolyte fluid; and

15 directing electrical energy-bearing electrolyte fluid towards the tissues for treating the tissues.

20 6. A method according to claim 1 further comprising the step of:

25 moving the energy treatment device with respect to the tissues within the patient's body for subjecting a large area of the tissues to energy-bearing electrolyte fluid.

30 7. A method according to claim 1 further comprising the step of:

25 holding the energy treatment device substantially fixed with respect to the tissues within the patient's body for subjecting a small area of the tissues to energy-bearing electrolyte fluid,

35 8. A method according to claim 1 wherein the electrolyte fluid comprises one of contrast media, a solution of sodium chloride, a solution of calcium salt, a solution of potassium salt, and a solution of a conductive radio-nuclide.

35 9. A method according to claim 1 further comprising means for positively directing electrolyte fluid disposed at the distal end of the energy treatment device, and further comprising the step of:

operatively contacting the electrolyte fluid with the means for positively directing electrolyte fluid for directing electrolyte fluid towards a selected area of the tissues.

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10. A method according to claim 9 wherein the means for positively directing electrolyte fluid comprises an expandable member, and further comprising the steps of:

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inserting the expandable member into the patient's body;

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expanding the expandable member within the patient's body; and

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operatively contacting the electrolyte fluid with the expandable member for directing electrolyte fluid towards a selected area of the tissue.

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11. A method according to claim 10 wherein the expandable member has an interior, and further comprising the step of:

passing electrolyte fluid into the expandable member, thereby expanding the expandable member.

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12. A method according to claim 1 further comprising means for positively directing electrolyte fluid disposed at the distal end of the energy treatment device, and further comprising the step of:

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shielding a portion of the tissues from the electrolyte fluid with the means.

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13. A method according to claim 1 wherein the electrode has an impedance and the electrolyte fluid has an impedance, and further comprising the step of:

selecting at least one of the electrode and the electrolyte fluid such that the impedance of the

electrode is substantially similar to the impedance of the electrolyte fluid to minimize generation of heat upon conveyance of the electrical energy on the electrode to the electrolyte fluid.

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14. A method for treating tissues within a patient's body with electrical energy, the method comprising the steps of:

10 providing an energy treatment device having an electrode and a distal tip insertable into the patient's body;

15 placing the distal tip within the patient's body adjacent the tissues to be treated with electrical energy;

20 energizing the electrode with electrical energy; and

25 passing a fluid over the electrode to prevent blood from clotting on the electrode when the electrode is energized with electrical energy.

15. A method according to claim 14 wherein the fluid is an electrolyte fluid, and further comprising the steps of:

25 passing the electrolyte fluid over the electrode such that electrical energy on the electrode is transmitted to the electrolyte fluid.

30 16. A method according to claim 15 further comprising the step of:

35 directing the electrolyte fluid from the electrode to the tissues within a patient's body for treating said tissues with electrical energy.

17. A method according to claim 16 wherein the directing step further comprises the step of:

substantially focusing the electrolyte fluid on the tissues.

5           18. A method according to claim 16 wherein the directing step further comprises the step of:  
                        dispersing the electrolyte fluid over the tissues.

10           19. A method for treating tissues within a patient's body with electrical energy, the method comprising the steps of:

                        providing an electrophysiology energy treatment device comprising an elongate catheter tube having a distal end insertable into a patient with an electrode located within the catheter tube adjacent the distal end;

                        energizing the electrode with electrical energy; and

20           20. A method for forming an electrical circuit through a patient's body, the electrical circuit for treating tissues within the patient's body with electrical energy, the method comprising the steps of:  
                        passing an electrolyte fluid through the catheter tube for conveying electrical energy from the electrode to the tissues to be treated.

25           20. A method for forming an electrical circuit through a patient's body, the electrical circuit for treating tissues within the patient's body with electrical energy, the method comprising the steps of:

                        providing a first electrode insertable within the patient's body;

30           inserting the first electrode into the patient's body;

                        positioning the first electrode within the patient's body proximal to and offset from the tissues to be treated;

35           providing an electrolyte fluid;  
                        electrically connecting the first electrode to the tissues to be treated with the

electrolyte fluid for delivering electrical energy from  
the first electrode to the tissues;

providing a second electrode connectable  
with the patient's body; and

5                   electrically connecting the second  
electrode to the tissues for delivering electrical energy  
from the tissues to the second electrode,

10                  21. A method for treating tissues within a  
patient's body with electrical energy, the method  
comprising the steps of:

15                  providing a first catheter tube having a  
distal tip insertable into the patient's body and an  
electrode locatable entirely within the patient's body;

20                  providing a second catheter tube having a  
distal end and a lumen of dimensions sufficient for  
accepting the first catheter;

25                  inserting the second catheter into the  
patient's body;

30                  positioning the second catheter adjacent  
the tissues;

35                  inserting the first catheter into the  
second catheter;

                      positioning the first catheter tube with  
respect to the second catheter tube such that the distal  
tip is offset proximally of the distal end;

                      energizing the electrode;

                      passing an electrolyte fluid through the  
first catheter for forming an electrical connection  
between the electrode and the electrolyte fluid; and

                      forming an electrical connection between  
the electrolyte fluid and the tissues being treated such  
that energy is transferred from the electrode to the  
tissues for treating the tissues.

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22. An electrophysiology energy treatment device for treating tissues within a patient's body with electrical energy, the energy treatment device comprising:

5 an elongate catheter tube having a distal end insertable into the patient's body;

10 an electrode within the catheter tube adjacent the distal end such that the electrode is disposed within the patient's body when the distal end is inserted into the patient's body; and

15 an electrolyte fluid disposed in the catheter tube for electrically connecting the electrode to the tissues within the patient's body for delivering energy from the electrode to the tissues.

20 23. An energy treatment device as defined in claim 22 further comprising a source of electrical energy electrically connected to the electrode; and wherein the source of electrical energy supplies radio frequency electrical energy to the electrode.

25 24. An energy treatment device as defined in claim 22 wherein the source of electrical energy supplies 50 Watts of electrical energy to the electrode at a frequency of approximately 500,000 Hertz.

30 25. An energy treatment device as defined in claim 22 further comprising a source of electrical energy; further comprising a wire extending through the catheter tube electrically connecting the source of electrical energy to the electrode; further comprising a source of electrolyte fluid connected to the catheter tube for supplying the catheter tube with electrolyte fluid; further comprising a wire lumen disposed within the catheter tube; and wherein the wire extends through

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the wire lumen such that the wire lumen electrically insulates the wire from the electrolyte fluid.

5           26. An energy treatment device as defined in claim 22 wherein the electrode is substantially cylindrical.

10           27. An energy treatment device as defined in claim 22 further comprising an aperture on the electrode for directing flow of electrolyte fluid and for facilitating energy transfer from the electrode to the electrolyte fluid.

15           28. An energy treatment device as defined in claim 22 wherein the electrode has a distal end; and wherein the distal end of the electrode is offset from the distal end of the catheter tube by a distance measuring substantially within the range of 0.08" to 0.5".

20           29. An energy treatment device as defined in claim 22 wherein the electrode comprises a silver-silver chloride material.

25           30. An energy treatment device as defined in claim 22 further comprising means for positively directing electrolyte fluid towards selected tissues within a patient's body.

30           31. An energy treatment device as defined in claim 30 wherein the means for positively directing electrolyte fluid towards selected tissues within a patient's body comprises a distal tip on the catheter tube.

5           32. An energy treatment device as defined in  
claim 31 wherein the distal tip has a substantially  
cylindrical configuration for substantially focusing flow  
of electrolyte fluid towards tissues to be treated.

10           33. An energy treatment device as defined in  
claim 31 wherein the distal tip has a substantially  
frusto-conical configuration.

15           34. An energy treatment device as defined in  
claim 30 wherein the means for positively directing  
electrolyte fluid towards tissues within a patient's body  
comprises an expandable member attached to the distal end  
of the catheter tube.

20           35. An energy treatment device as defined in  
claim 34 wherein the tissues to be treated have a  
configuration; and wherein the expandable member has a  
preformed configuration corresponding to the  
configuration of the tissues for facilitating contact  
between the tissues and the electrolyte fluid.

25           36. An energy treatment device as defined in  
claim 34 wherein the expandable member has an interior;  
wherein the expandable member is attached to the distal  
end of the catheter tube so that electrolyte fluid in the  
catheter tube can flow into the interior, thereby causing  
the expandable member to expand; and further comprising a  
perforation on the expandable member for allowing  
electrolyte fluid within the interior to flow through the  
perforation to the tissues being treated.

30           37. An energy treatment device as defined in  
claim 34 wherein the expandable member comprises an  
elastomer.

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5           38. An energy treatment device as defined in  
claim 30 wherein the means for positively directing  
electrolyte fluid towards the tissues to be treated  
comprises a deflecting body located at the distal end of  
the catheter tube.

10           39. An energy treatment device as defined in  
claim 38 wherein the deflecting body is a non-conductor.

15           40. An energy treatment device as defined in  
claim 38 wherein the deflecting body has a substantially  
frusto-conical configuration.

20           41. An energy treatment device as defined in  
claim 38 wherein the electrode has a distal end; and  
wherein the deflecting body is attached to the distal end  
of the electrode.

25           42. An energy treatment device as defined in  
claim 22 wherein the electrode has a distal end located  
within the catheter tube and offset proximally of the  
distal end of the catheter tube; and further comprising a  
deflecting body attached to the distal end of the  
electrode for dispersing flow of electrolyte fluid  
distally of the electrode.

30           43. An electrophysiology treatment device for  
treating tissues within a patient's body with electrical  
energy, the treatment device comprising:

35           an elongate catheter tube having a distal  
end insertable into a patient;

              an energizable electrode located within  
the catheter tube adjacent the distal end such that the  
electrode is insertable within the patient's body;

              a fluid lumen extending through the  
catheter tube; and

a fluid flowing through the catheter tube under sufficient pressure for substantially preventing blood from clotting on the electrode when energized.

5           44. An electrophysiology treatment device as defined in claim 43 wherein the fluid is an electrolyte.

10           45. An electrophysiology treatment device as defined in claim 44 wherein the electrolyte comprises at least one of a solution of sodium chloride, contrast media, a solution of a calcium salt, a solution of a potassium salt, and a solution of a radio-nuclide.

15           46. An electrophysiology treatment device as defined in claim 45 wherein the electrolyte comprises a solution of about 35 grams of sodium chloride in about 100 milliliters of water.

20           47. An electrophysiology treatment device as defined in claim 43 wherein the fluid is an electrical conductor; and wherein the electrode is electrically connected to the tissues within the patient's body by the fluid.

25           48. An electrical circuit formed through tissues in a patient's body for treating the tissues with electrical energy, the electrical circuit comprising:

      a first electrode entirely insertable into the patient's body;

30           an electrolyte fluid electrically connecting the electrode to the tissues to be treated so that electrical energy can travel from the electrode to the tissues; and

35           a second electrode electrically connected to the patient's body so that electrical energy can travel from the tissues to the second electrode.

49. An electrical circuit as defined in claim  
48 wherein the first electrode comprises a silver-silver  
chloride material.

5 50. An electrical circuit as defined in claim  
49 wherein the electrolyte comprises at least one of a  
solution of sodium chloride, contrast media, a solution  
of a calcium salt, a solution of a potassium salt, and a  
solution of a radio-nuclide.

10 51. An electrical circuit as defined in claim  
48 wherein the electrolyte is passed across the electrode  
at a predetermined pressure; and wherein the pressure is  
sufficient for substantially preventing blood from  
clotting on the electrode.

15 52. An electrical circuit as defined in claim  
48 wherein the first electrode is disposed within a  
catheter tube; wherein the electrolyte fluid defines a  
fluid flow path between the first electrode and the  
tissues; and further comprising means for positively  
directing electrolyte fluid towards tissues within a  
patient's body disposed within the fluid flow path.

20 25 53. An electrical circuit as defined in claim  
52 comprises a distal tip on the catheter tube.

30 35 54. An electrical circuit as defined in claim  
53 wherein the distal tip has a substantially cylindrical  
configuration for substantially focusing the fluid flow  
path,

55. An electrical circuit as defined in claim  
53 wherein the distal tip has a substantially frusto-  
conical configuration for dispersing the fluid flow path.

5           56. An electrical circuit as defined in claim  
52 wherein the means for positively directing electrolyte  
fluid towards tissues within a patient's body comprises  
an expandable member operatively connected to the  
catheter tube.

10           57. An electrical circuit as defined in claim  
56 wherein the tissues to be treated have a  
configuration; and wherein the expandable member has a  
configuration corresponding to the configuration of the  
tissues.

15           58. An electrical circuit as defined in claim  
56 wherein the expandable member has an interior; wherein  
the expandable member is operatively connected to the  
catheter tube so that electrolyte fluid in the catheter  
tube can flow into the interior, thereby causing the  
expandable member to expand; and further comprising a  
perforation on the expandable member for allowing  
electrolyte fluid within the interior to flow through the  
perforation to the tissues being treated.

20           59. An electrical circuit as defined in claim  
56 wherein the expandable member comprises an elastomer.

25           60. An electrical circuit as defined in claim  
52 wherein the means for positively directing electrolyte  
fluid towards the tissues to be treated comprises a  
deflecting body located within the fluid flow path.

30           61. An electrical circuit as defined in claim  
60 wherein the deflecting body is a non-conductor.

35           62. An electrical circuit as defined in claim  
60 wherein the deflecting body has a substantially  
frusto-conical configuration.

63. An electrical circuit as defined in claim  
60 wherein the electrode has a distal end; and wherein  
the deflecting body is attached to the distal end of the  
electrode.

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